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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,801	05/15/2007	Johannes Ante	1454.1742	2400

21171 7590 12/12/2008

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EXAMINER	
HOQUE, FARHANA AKHTER	
ART UNIT	**PAPER NUMBER**
4176	
MAIL DATE	**DELIVERY MODE**
12/12/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,801	ANTE ET AL.	
	Examiner	Art Unit	
	FARHANA HOQUE	4176	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/15/07;8/17/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the Applicant's communication filed on May 15, 2007 and preliminary amendment concurrently filed therewith. In virtue of this amendment, original claims 1-10 are canceled; claims 11-22 are newly added; and thus, claims 11-22 are now presented in the instant application.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119 (a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS's) submitted on 5/15/2007 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

3. The subject matter of this application admits of illustration by drawings to facilitate understanding of the invention. Applicant is required to furnish drawings under 37 CFR 1.81(c). No new matter may be introduced in the required drawing. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d).

Claim Objections/Minor Informalities

4. Claim 22 is objected to because of the following informalities:

Claim 22, line 1, "22" should be changed to - - 21 - - ;

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 11 and 12 are rejected under 35 U.S.C 102(e) as being unpatentable over Spencer (U.S. Patent No. 3,231,815).

With respect to claim 11, Spencer discloses, a method for monitoring particle concentration in a gas stream, comprising: (1) collecting particles by a sensor (see Fig. 2) in the gas stream, the sensor integrated as a capacitive element [32] (see Fig. 3) into an electromagnetic resonant circuit; exciting the resonant circuit with an alternating voltage (see col. 3, lines 24-29); (2) determining a characteristic variable of the resonant circuit which can vary as a result of particle load of the sensor, as a reference value when the sensor is not loaded (see col. 3, lines 44-47), where the characteristic variable is one of a resonant frequency of the resonant circuit and a voltage across the sensor when the

resonant circuit is excited by the alternating voltage having a fixed frequency and fixed amplitude (see col. 3, lines 24-26); and (3) determining a change in the characteristic variable brought about by the particle load compared to the reference value (see col. 5, lines 13-21).

With respect to claim 12, Spencer discloses, the method as recited in claim 11, wherein the frequency of the alternating voltage exciting the resonant circuit is tuned to a respective resonant frequency of the resonant circuit, and the frequency of the exciting voltage is determined as the characteristic variable (see col. 3, lines 24-32).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spencer, (U.S. Patent No. 3,231,815) in view of Wienand et al. (U.S. Publication No. 2008/0190173 A1).

With respect to claim 13, Spencer et al. discloses the method as recited in claim 12.

Spencer does not disclose heating the sensor, during said determining of the characteristic variable, to a temperature below an ignition temperature of the particles and sufficient to remove impurities adhering to the sensor.

Wienand et al. discloses, heating the sensor, during said determining of the characteristic variable, to a temperature below an ignition temperature of the particles and sufficient to remove impurities adhering to the sensor [see Wienand para. 0062, lines 12-20].

It would have been obvious to one of ordinary skill in the art at the time of the invention to supplement the method of Spencer with a step of heating the sensor during the determination of the characteristic variable to a temperature below an ignition temperature as taught by Weinand et al. for accurate readings since Wienand et al. teaches that such heating would remove impurities adhering to the sensor (see Weinand, para 0062, lines 12-20].

With respect to claim 14, the combination of Spencer and Wienand et al. disclose all the limitations according to claim 13, further comprising a method of heating the sensor, before said determining of the characteristic variable, to a temperature above the

ignition temperature of the particles and sufficient to remove a particle load [see Wienand, para. 0045, lines 1-4].

With respect to claim 15, the combination of Spencer and Wienand et al. disclose all the limitations according to claim 14, wherein the particles are soot particles in an exhaust gas stream of an internal combustion engine [see Wienand, para. 0047, lines 1-5].

9. Claims 16-19 are rejected under 35 U.S.C 103(a) as being unpatentable over Spencer, (U.S. Patent No. 3,231,815) in view of Kurz (U.S. Patent No. 6,465,749 B1).

With respect to claim 16, Spencer discloses, a device, excited with alternating voltage, for monitoring particle concentration in a gas stream, comprising: (1) an electromagnetic resonant circuit excited with the alternating voltage (see Spencer, col. 3, lines 24-29); a sensor (see Spencer, Fig. 2) in the gas stream, integrated as a capacitive element [32] (see Spencer Fig. 3) into the electromagnetic resonant circuit, collecting particles. Additionally, Spencer discloses a characteristic variable determiner determining change in a characteristic variable of the electromagnetic resonant circuit (see Spencer col. 3, lines 32-36), the characteristic variable varying as a result of particle load of said sensor (see Spencer col. 4, lines 37-38), from a reference value determined when said sensor is not loaded (see Spencer col. 3, lines 44-58) due to having been heated above an ignition temperature of the particles, where the characteristic variable is one of a resonant frequency of the resonant circuit and a voltage across the sensor when the resonant circuit is excited by the alternating voltage having a fixed frequency and fixed amplitude (see Spencer col. 3, lines 24-26).

Spencer does not disclose the sensor to have a nonconductive base body made of porous material and two electrodes spaced apart from one another.

Kurz discloses, having a nonconductive base body [170] (see Kurz, Fig. 2) made of porous material and two electrodes [166, 168] (see Kurz Fig. 1) spaced apart from one another (see Kurz col. 6, lines 55-59; also col. 7, lines 4-7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to supplement the method of Spencer to include a nonconductive base body made of porous material and two electrodes spaced apart from one another as taught by Kurz, to preserve small pathways that extend completely through the body of the filter (see Kurz; col. 6, lines 55-59; also col. 7, lines 4-7).

With respect to claim 17, the combination of Spencer and Kurz disclose all the limitations according to claim 16, wherein the nonconductive base body is composed of ceramic (see Kurz, col. 6, lines 55-59).

With respect to claim 18, the combination of Spencer and Kurz disclose all the limitations according to claim 17, wherein the electrodes [166, 168] (see Kurz Fig. 1) are embedded in the nonconductive base body (see Kurz, col. 7, lines 4-7).

With respect to claim 19, the combination of Spencer and Kurz disclose all the limitations according to claim 18, wherein the electrodes are arranged on a side of the nonconductive base body inaccessible to the particles [166, 168] (see Kurz, Fig. 1).

10. Claim 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spencer (U.S. Patent No. 3,231,815) in view of Kurz as applied to claims 16- 19 above, and further in view of Wienand et al. (U.S. Publication No. 2008/0190173 A1).

With respect to claim 20, the combination of Spencer and Kurz disclose all the limitations of claim 19.

The combination of Spencer and Kurz do not disclose all the limitations of claim 20.

Wienand et al. discloses, a heating device heating said sensor above the ignition temperature of the particles prior to determining the reference value of the characteristic variable [see Wienand, para. 0045, lines 1-4].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of the combination of Spencer and Kurz by additionally arranging a heating device as taught by Weinand et al. to heat the sensor in order to determine the reference value of the characteristic variable [see Weinand, para. 0045, lines 1-4]

With respect to claim 21, the combination of Spencer, Kurz, and Wienand et al., disclose all the limitations according to claim 20, wherein the base body includes a catalytically active layer [see Weinand, para. 0052, lines 18-28].

With respect to claim 22, the combination of Spencer, Kurz, and Wienand et al., disclose all the limitations according to claim 21, wherein the particles are soot particles in an exhaust gas stream of an internal combustion engine [see Weinand, para. 0047,

lines 1-5].

Citation of Pertinent Prior Art

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1) Conrad and Weber (U.S. Patent No. 6,346,888 B1) discloses a non-resonant electromagnetic energy sensor.

2) Coulthard and Cheng (U.S. Patent No. 6,305,231 B1) discloses a method of measuring a characteristic of a flowing fluid by means of two or more sensors.

3) Lilienfeld (U.S. Patent No. 6,055,052) discloses a system for monitoring airborne particulate including an optical sensor to measure size characteristics.

4) Hepher and Hides (U.S. Patent No. 5,056,355) discloses a dual monitor comprising a piezoelectric sensor in the form of a quartz crystal.

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FARHANA HOQUE whose telephone number is (571)270-7543. The examiner can normally be reached on Monday - Friday 7:30-5:00pm, Alternate Friday's Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thuy V. Tran can be reached on (571) 272-1828. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/F.H./

/Thuy Vinh Tran/
Supervisory Patent Examiner, Art Unit 4176